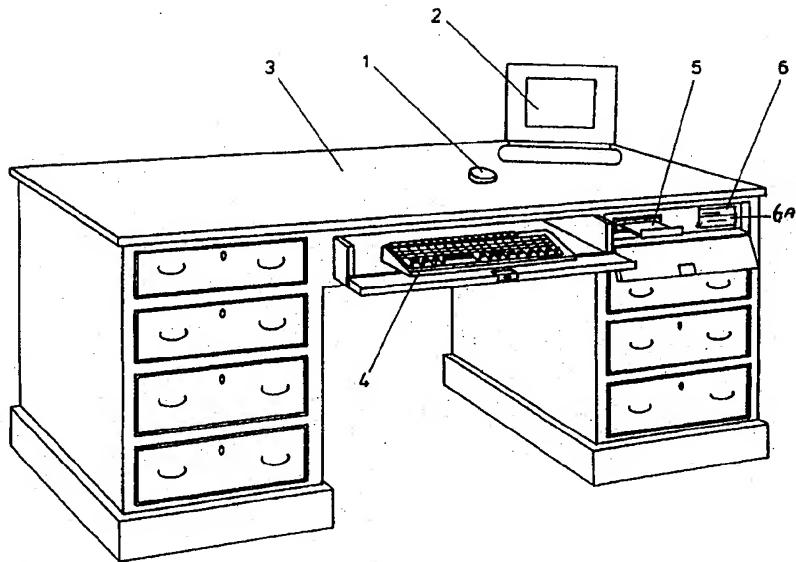




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(71) Applicant (for all designated States except US): POWERDESK PLC [GB/GB]; 44 High Street, Billingshurst, Sussex RH14 9NY (GB).			
(72) Inventor; and			<b>Published</b>
(75) Inventor/Applicant (for US only): GILBERT, David, William [GB/GB]; Powerdesk PLC, 44 High Street, Billingshurst, Sussex RH14 9NY (GB).			With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.
(74) Agents: GODDARD, David, John; Harrison Goddard Foote, 1 Stockport Road, Marple, Stockport SK6 6BD (GB) et al.			

## (54) Title: COMPUTERS



## (57) Abstract

Installed within an item of furniture, such as a desk or writing table, is a personal computer (PC) coupled to a card reader, the output of the reader being arranged to control operation of the personal computer. The output of the reader is arranged to control operation of the PC, for example whether the PC starts-up, and/or whether the user is allowed operational access to the PC. Where the PC is hired to a user, the card may indicate the amount of time or credit available to the user. For security purposes, for example in office use, the card may determine the type of access afforded, or the facilities available to, to a user. In a preferred embodiment, the card is a smart card.

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Computers

The present invention relates to computers of the type commonly known as personal computers.

5

In general, a personal computer (PC) provides sufficient computing power for use by an individual, and it may provide a number of facilities, depending on resident or loadable programmes, or by virtue of being coupled in 10 network of computers. Word processing, game playing, and access to the Internet are three facilities often required, individually or in combinations. Input to the computer is commonly by way of a keyboard, mouse or touchpad, and the output is commonly a flat screen or CRT 15 display, optionally with an audible output.

Many PCs consist of a central processor (base unit) with separate or separable input and output means and are sufficiently large as to be effectively non-portable.

20

Portable and laptop computers are a variety of PC which normally have the input and output means constructionally integrated with the central processor, the display being a flat screen, and so can be more easily transported by the individual. Nevertheless, although weight and volume 25 are reduced, the carrying thereof is not without its difficulties, and there is always the danger of damage, loss or theft during a journey. In addition, factors such as the computing power, and the quality of the display, are often a compromise resulting from the need 30 to provide portability.

It may therefore be considered desirable to have stations where a PC is available to a potential user, e.g. on payment of a charge. For example, a suite of PCs may be 35 provided at an airport for use by businessmen while they are waiting for their flight, or rooms at a hotel may each be fitted with a PC for use by a businessman as a

word processor or for access to the Internet, or for use by a family for playing games.

Under such circumstances, security problems arise, both 5 in respect of theft of the computer, or a part thereof (for example the processor chip), and as to how use of the computer can be controlled and/or charged for.

10 The present invention provides an item of furniture, such as a desk or writing table in which is installed a personal computer system, said system comprising a personal computer coupled to a card reader, the output of the reader being arranged to control operation of the personal computer.

15 The furniture may have a work surface or essentially flat top surface, preferably substantially unbroken, that overlies and substantially closes a compartment in which is mounted the PC, the work or top surface being movable or removable for access to said compartment.

20 In the furniture, external access means to the PC, such as means for receiving the card for passage to the card reader, and/or disc or CDROM ports, or a switch, may be concealed by a movable or removable part of the furniture, such as a false drawer front

25 By installing the system in the item of furniture, it is possible to make physical access to any part thereof 30 (save for access points for operating the computer, which points - such as disc ports and the slot or port for the card reader - which can be built into the item of furniture itself) very difficult,

35 Although the term "reader" is used, implying derivation of information from the card, it should be understood that there will often, although not necessarily, also be

the supply of information to the card, this information being used or stored on the card for example. Derivation of information from the card may be effected by various known means, including the use of magnetic or optical interaction, radio transmission and direct electrical contact, and the same type of means, or a different one of the known means can be used for writing to the card.

10 The card may be arranged to store time (or credit) information, the PC or card reader being arranged to decrement the time (or credit) stored on the card according to use. For example, where the PC provides a plurality of selectable facilities, the rate of decrementing may be determined by which facility is 15 selected.

It may be arranged that the output of the reader 20 determines whether the personal computer starts-up, or whether the user is allowed operational access to the computer.

Preferably, it may be arranged that the output of the reader enables start-up of the PC in response to detection of more than a first predetermined amount of 25 time (or credit) stored on the card and/or causes the PC to close down or prohibit functional access when less than a second predetermined amount of time (or credit) remaining is detected on the smart card. Furthermore, detection of a third predetermined amount of time (or 30 credit) remaining may cause the PC to issue a warning (message/sound). When both are applicable, the first amount will be larger than the second amount, and any third amount will fall between the first and second amounts. The second amount may be zero.

It may be arranged that the PC stores parameters relating to its state at the time that the second amount is detected, to avoid data loss.

- 5 It may additionally or alternatively be arranged that the output of the reader controls which one, or which combination, of the facilities are made available to the user.
- 10 The item of furniture may be arranged for use with a smart card which contains at least part of the start-up system of the PC, whereby the PC cannot be started without the presence of a said smart card. Alternatively, the card reader may for use with a passive card having
- 15 information encoded thereon, and in either case, the reader may also be arranged to supply information to the card.

In one preferred embodiment, the output of the reader determines whether the PC starts-up. This could be done, for example, by incorporating part of the PC start-up or boot system in a smart card, or a card containing a digital memory such as a ROM, so that presence of the smart card is essential for getting the computer operative. Alternatively, or additionally, information on the card could be used to provide a signal determining whether and/or which facilities on the PC are available to the user, that is to say, whether and/or what functional access is afforded to the user.

30 Either of these two alternatives could use a read-only card. However, in the latter alternative, such information could include an indication as to the amount of credit allowed to the user (entered, for example, on the card at or prior to purchase), and since this amount is expected to change, the card will also need to be writable. Where the card is a passive card, for example

of the type containing a rewritable data store such as a magnetic strip, the store could be re-written under control of the card reader or the PC to decrease the amount of credit as the PC is used. Where the card is a 5 smart card, the decrease could alternatively be controlled by the smart card itself in response to a signal indicative of the fact of operation and/or the mode of operation of the computer. In either case, the decrease could be a function of time that the computer is 10 used, and, optionally, the rate of decrease could be related to the computer facility which has been selected (see below).

Thus start-up of the PC or functional access thereto may 15 be enabled in response to detection of more than a first predetermined amount of credit on the card. The PC may be caused to close down or disable access (hereinafter both will be covered by the term "close") when less than a second predetermined amount of credit is detected on 20 the smart card. In one instance, the first and second amounts may be the same, e.g. zero, but preferably the first amount is greater than the second. In the latter case a warning of imminent closure of, the PC, such as in 25 the form of a display or sound, may be produced by the PC when the decreasing amount of credit reaches a third amount intermediate the first and second amounts.

In either case, it is preferred that detection of the second predetermined amount causes the PC to store 30 parameters relating to the state of the computer at that time, thereby avoiding loss of data when the computer closes, for example when a document is undergoing word-processing. For security, recovery of the data may be permitted only in response to use of the same card.

35

Although the PC may provide a single facility, it will often be capable of providing a plurality of selectable

facilities. In such a case, while it could be that each of the facilities is selectable by the user, it can be arranged that the output of the reader controls which one, or which combination, of the facilities are made 5 available to the user.

The card itself could be arranged to be used for other purposes, if desired. For example, in a hotel, the card could be the same as that permitting entry to the hotel 10 room and/or permitting the use of other services, such as the purchasing of items, including meals and refreshments.

The system of the invention could be used in ways other 15 than for charging a customer for use of a PC. For example, the card could be used as a security device without which access to a PC, or to all or part of information or facilities on a PC, is effectively not permitted. Thus the card could contain information 20 relating to the user, indicating which facilities are accessible to that particular user, and which files are accessible. For example, some employees in an office may be restricted to use of a PC as a word processor, with access restricted to a certain set of stored document 25 files, whereas others may have access to all word processing files and additionally have access to the Internet. Such a system is preferably arranged to work in conjunction with the requirement to enter a PIN (Personal Identification Number) via a keyboard. In a 30 similar manner, certain facilities in a PC installed in a hotel room might only be accessible to hotel employees.

A knowledge of further features and advantages of the 35 invention may be gained from a perusal of the appended claims, to which the reader is referred, and from the following description of an exemplary embodiment of the

invention, made with reference to the accompanying drawings in which:

5 Figure 1 shows an embodiment of the invention, in the form of a wooden desk in which is installed a personal computer (PC) and a card reader for controlling operation of the PC;

10 Figure 2 shows the desk of Figure 1 opened for access to a keyboard, disc ports, and a card reader slot (port);

Figure 3 shows a PC mounted in the desk of Figure 1; and

15 Figure 4 shows the location of the keyboard within the desk of Figure 1.

Figures 1 and 2 are general views of a wooden two-peDESTAL writing desk, the former showing the closed desk, and the latter showing the desk when opened for use 20 of the PC, with access to a keyboard 4, CDROM port 5, floppy disc port 6 and card reader port 6A. The keyboard 4, CDROM port 5 and floppy disc port 6 are all optional items, and some or all may be omitted.

25 A mouse 1, which may communicate with the PC by infrared, lying on the desktop 3 is also optional. The figures show a removable flat screen display on the desk top; for security purposes it may be more appropriate to exchange this for a more bulky CRT VDU, or to build a 30 flat screen display into the desk top, for example in the manner described and claimed in our copending UK Patent Application published under Serial Number GB 2 319 467 A, to which the reader is referred. Thus the invention extends to an item of furniture as defined herein and 35 having a substantially top or flat work surface and a display which comprises a flat screen display device with a substantially flat surface, wherein the top or work

surface includes an aperture or recess arranged to accommodate the flat screen display device in a flush position with its said flat surface substantially flush with the top or work surface, the display being 5 displaceable out of the top or work surface from the flush position to a viewing position. Preferably the said flat surface is a major surface of the display.

Communication between the display and the PC could be by 10 hard wiring means, or wireless means, for example inductive coupling.

Figure 3 illustrates the siting of PC 7 in a space under the desk top 3 which would normally be occupied by a 15 drawer. It is composed of a plurality of different items, including a motherboard with CPU and memory, power supply 9, CDROM drive 10, floppy disc drive 11, and card reader 11A, all or most of which would conventionally be built into a metal casing. At least some of these items 20 are now separately assembled onto a base 12, for example of wood, forming an integral part of the desk, while the ports for drives 10, 11 and reader 11A are built into a front panel 13 of the desk itself. It will be appreciated that the lack of the conventional metal 25 casing and the distribution of the parts over the base 12 forming part of the desk makes it difficult to remove the PC alone.

Furthermore, while in Figure 3 the desktop 3 is shown as 30 having been pivoted upwards about hinges 18 at its rear to permit physical access to the PC, for example for repair, maintenance or modification, the top is normally secured in a closed position, thereby preventing access to any major part of the PC.

35

The ports 5, 6 and 6A are preferably concealed by a false drawer front 14 when they are not in use. Front 14,

which is optional, preferably matches the other drawers of the desk, for example in general design and furniture, in height (with horizontally adjacent drawers, and/or in width (with vertically adjacent drawers). Front 14 is 5 preferably lockable, and when unlocked may either be removed entirely, or, as shown, pivoted about bottom hinges.

As shown in detail in Figure 4, a further lockable 10 movable/removable false drawer front may be provided centrally of the desk over a space or sliding shelf for accommodating a keyboard and/or for storing other items such as the mouse or flat screen display when not in use. For security, the keyboard could be permanently affixed 15 to the sliding shelf.

Where appropriate, the desk will include other manual controls for the computer, for example an on/off switch 20 which is also advantageously located beneath one of the false drawer fronts.

## CLAIMS:

1. An item of furniture in which is installed a personal computer (PC) coupled to a card reader, the 5 output of the reader being arranged to control operation of the personal computer.
2. An item of furniture according to claim 1 having a work surface or essentially flat top surface that 10 overlies and substantially closes a compartment in which is mounted the PC, the work or top surface being movable or removable for access to said compartment.
3. An item of furniture according to claim 2 wherein 15 the work or top surface is substantially unbroken.
4. An item of furniture according to any preceding claim in the form of a desk or writing table.
- 20 5. An item of furniture according to any preceding claim and comprising external access means to the PC, said external access means being concealable by a movable or removable part of the furniture.
- 25 6. An item of furniture according to claim 5 wherein said movable or removable part is a false drawer front.
7. An item of furniture according to claim 5 or claim 6 wherein said concealable external access means includes 30 means for receiving the card for passage to the card reader.
8. An item of furniture according to any one of claims 5 to 7 wherein said external access means comprises at 35 least one port for a floppy disc or CDROM.

9. An item of furniture according to any preceding claim wherein the card stores time (or credit) information, and the PC or card reader is arranged to decrement the time (or credit) stored on the card  
5 according to use.

10. An item of furniture according to any one of claims 1 to 8 wherein the card is a smart card stores time (or credit) information, and is arranged to decrement the  
10 time (or credit) stored on the card according to use

11. An item of furniture according to claim 9 or claim 10 wherein the reader enables start-up of the PC in response to detection of more than a first predetermined  
15 amount of time (or credit) stored on the card.

12. An item of furniture according to any one of claims 9 to 11 arranged to cause the PC to close down or prohibit functional access when less than a second predetermined amount of time (or credit) remaining is  
20 detected on the smart card.

13. An item of furniture according to any one of claims 9 to 12 wherein detection of a third predetermined amount  
25 of time (or credit) remaining causes the personal computer to issue a warning (message/sound).

14. An item of furniture according to any preceding claim wherein the personal computer provides a plurality  
30 of selectable facilities.

15. An item of furniture according to any one of claims 9 to 3 wherein the personal computer provides a plurality  
35 of selectable facilities and the rate of decrease of time or credit is determined by which facility is selected.

16. An item of furniture according to claim 14 or claim 15 wherein the output of the reader controls which one, or which combination, of the facilities are made available to the user.

5

17. An item of furniture according to any preceding claim for use with a smart card which contains at least part of the start-up system of the PC, whereby the PC cannot be started without the presence of a said smart 10 card.

18. An item of furniture according to any one of claims 1 to 16 wherein the card reader is for use with a passive card having information encoded thereon.

15

19. An item of furniture according to any preceding claim wherein the reader is also arranged to supply information to the card.

20 20. An item of furniture according to any preceding claim wherein the output of the reader determines whether the personal computer starts-up.

21. An item of furniture according to any preceding 25 claim wherein the output of the reader determines whether the user is allowed operational access to the computer.

22. An item of furniture according to any preceding claim, having a substantially top or flat work surface 30 and a display which comprises a flat screen display device with a substantially flat surface, wherein the top or work surface includes an aperture or recess arranged to accommodate the flat screen display device in a flush position with its said flat surface substantially flush 35 with the top or work surface, the display being displaceable out of the top or work surface from the flush position to a viewing position.

23. An item of furniture according to claim 22 wherein said flat surface is a major surface of the display.

5 24. An item of furniture substantially as hereinbefore described with reference to the accompanying drawings.

10

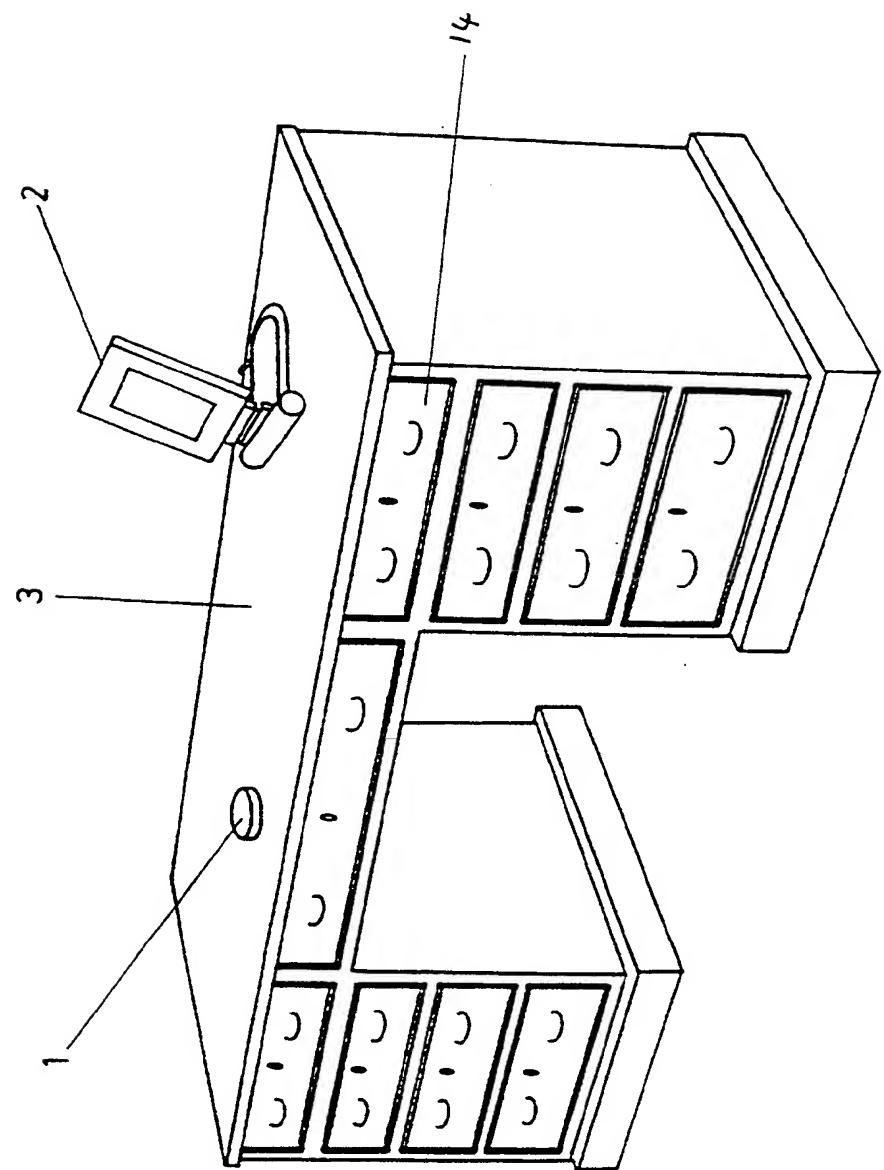


FIG. 1

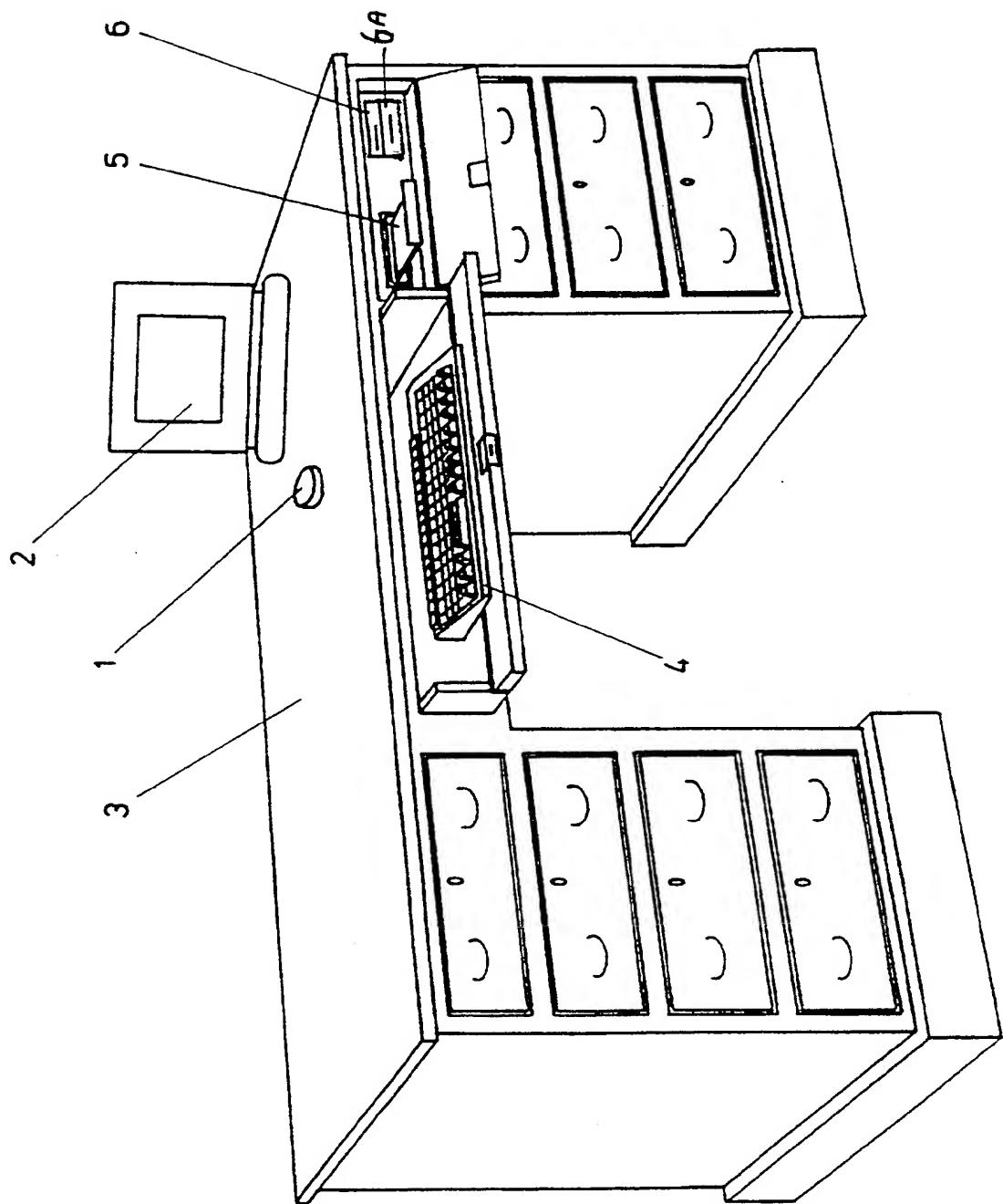


FIG. 2

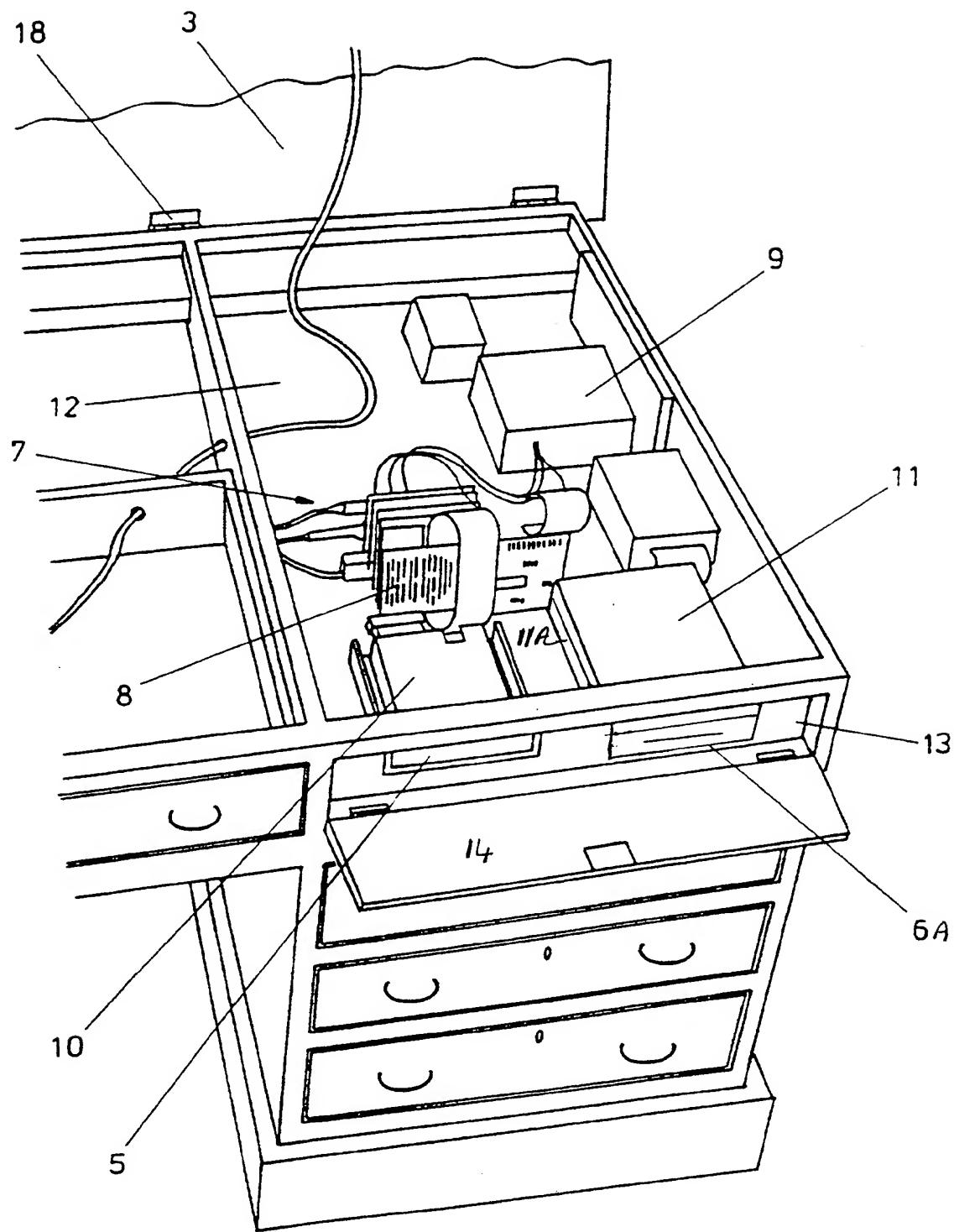


FIG. 3

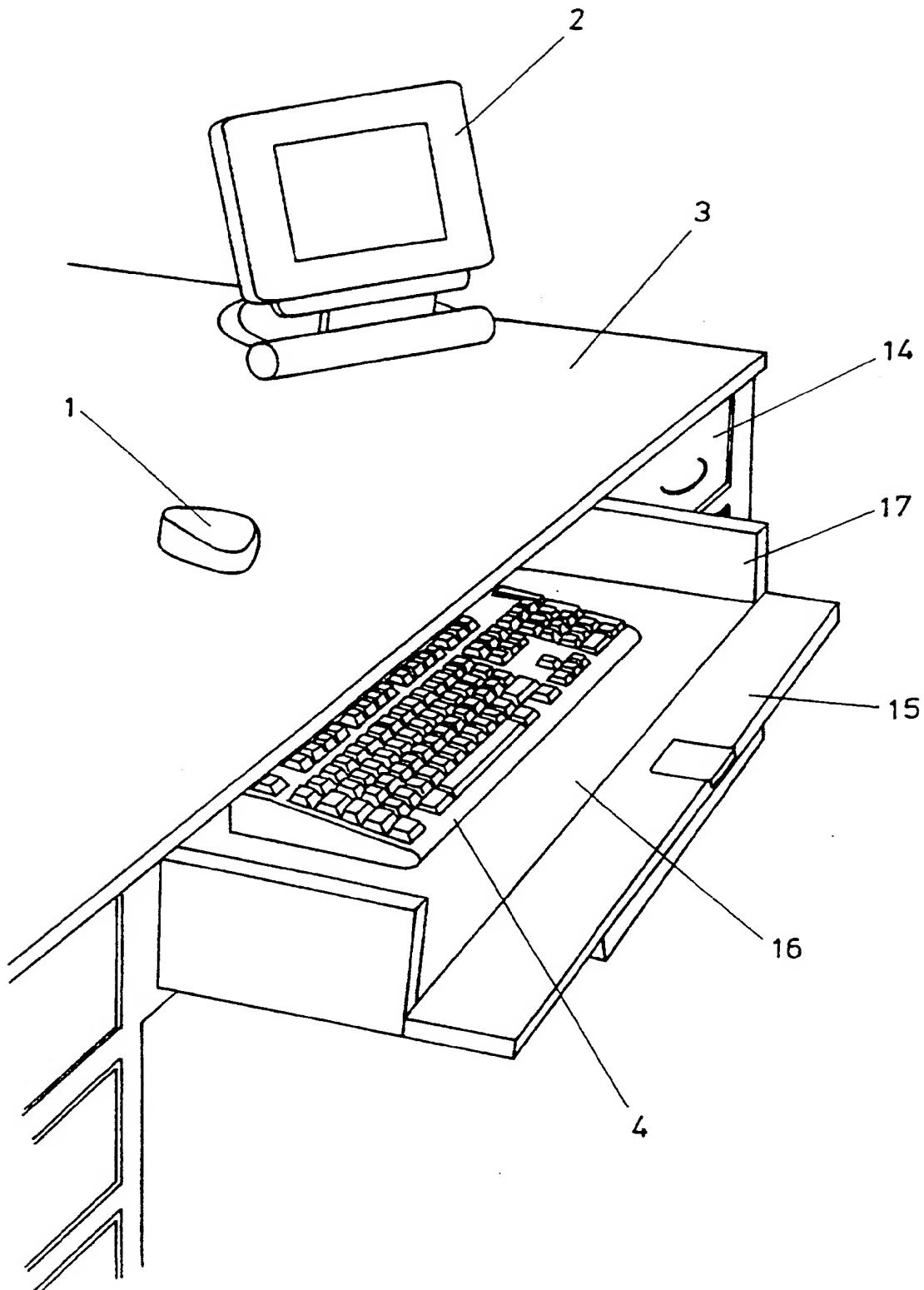


FIG. 4

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 98/02992

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 G07F7/00 A47B21/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A47B G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 15213 A (HU) 1 May 1997 see page 3, paragraph 3 – page 4, paragraph 2; figure 23 ---	1-4, 8-24
X	DE 297 10 962 U (BERLINER VERKEHRSBETRIEBE (BVG)) 21 August 1997	1-3, 18, 20, 21
A	see the whole document ---	5
X	EP 0 120 771 A (COMPAGNIE INDUSTRIELLE DES TECHNIQUES POUR L'INFORMATIQUE, CITI, SA) 3 October 1984 see the whole document ---	1
A	WO 97 13432 A (POWERDESK PLC) 17 April 1997 * abstract * -----	1, 4-6, 8

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Patent family members are listed in annex.

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Date of the actual completion of the international search

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NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
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Authorized officer

Noesen, R

**INTERNATIONAL SEARCH REPORT**

Interr. Application No

PCT/GB 98/02992

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